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Fred Armstrong
Natural Resource Program Manager
Guadalupe Mountains National Park
HC 60, Box 400
Salt Flat, TX 79847-9400

Dear Fred:

This letter summarizes the results of our field evaluation conducted in the Guadalupe Mountains National Park on Thursday November 14, 2002. Since the park is located in the jurisdiction of Region 8, Steve Clarke, Entomologist, Forest Health Protection, Alexandria Field Office, Louisiana, accompanied us, along with Dr. Robert Coulson, Department of Entomology, Texas A&M University, College Station, Texas. The purpose of our visit was to identify the agents causing the ponderosa pine and Douglas-fir mortality in the park.

We examined several dead ponderosa pines along Upper Dog Canyon and along the north side of South McKittrick Canyon. Ips beetles, possibly *Ips pini*, were found underneath the bark of the dead pines along Upper Dog Canyon. At the higher elevations, in the mixed conifer forest cover type, egg galleries of both ips beetles and roundheaded pine beetles (*Dendroctonus adjunctus*) were found etched on the underside of the bark and wood of the dead trees. As indicated in the enclosed pamphlets, "Engraver Beetles in Southwestern Pines" and "Forest Insect and Disease Leaflet 155," these insects are native to the Southwest. They normally play a beneficial role in pine ecosystems. They act as natural thinning agents colonizing trees that have been weakened by drought, fire, severe windstorms, or heavy snowstorms. The trees in the park were most likely predisposed to attack by the drought that we have been experiencing these past several years. As you mentioned on the trail, the park has been experiencing below-average precipitation for almost 5 years now. If these below-average precipitation levels persist, I suspect these bark beetles will continue to attack drought-stressed pines again in 2003. The enclosed pamphlets provide detailed information on the hosts, evidence of infestation, and life stages and biology of these bark beetles. Although we saw no signs of western pine beetle (*Dendroctonus brevicomis*) activity, this bark beetle is often found in association with ips beetles and roundheaded pine beetles. Forest Insect & Disease Leaflet 1, Western Pine Beetle, also enclosed, provides information on hosts, damage, evidence of infestation, and life stages and development of this insect.

The large majority of the tree mortality observed in the park was caused by the Douglas-fir beetle (*Dendroctonus pseudotsugae*). Douglas-fir beetles normally kill small groups of trees, but losses can be devastating during periodic outbreaks (Figure1).

Figure 1. Douglas-fir beetle caused tree mortality, Guadalupe Mountains National Park, Texas.

Douglas-fir beetle infestations usually occur in trees damaged by windfalls, fire-scorch, or defoliation. Where susceptible trees are abundant, the beetle population can build up rapidly. Damage is greatest in dense stands of mature trees. Host tree susceptibility to attack is correlated with drought and root disease. Various fungi introduced by the beetles also contribute to mortality of infested trees. Although no adult bark beetles were detected, the egg and larval galleries found identified the cause of this mortality (figure 2 & 3). Douglas-fir beetle-caused tree mortality is currently at outbreak levels and is expected to continue at outbreak levels in the park in 2003. As with the pines, these trees were predisposed to attack by the droughty conditions currently occurring in the park and throughout most of the Southwest.. Enclosed is Forest Insect & Disease leaflet 5 Douglas-fir beetle, which provides a description of the life stages, seasonal history, and galleries and characteristics of infestation.

Because Guadalupe Mountains National Park is within the boundary of Region 8, the Alexandria Field Office will be providing any additional technical assistance the park requires to meet goals and objectives regarding insect and disease monitoring, detection, and evaluation, etc. If you require further assistance please contact Forrest Oliveria, Field Office Representative at (318) 473-7294 or Stephen Clarke at (936) 639-8646.

Figure 2. Douglas-fir beetle larval galleries fanning outward on host Douglas-fir.

Figure 3. Douglas-fir bark with Douglas-fir larval galleries fanning outward from egg galleries

If you have any question regarding this evaluation, please contact me at (505) 842-3287 or e-mail me at trogers@fs.fed.us .

Sincerely,

/s/ Terrence J. Rogers
TERRENCE J. ROGERS
Entomologist, Forest Health,
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Enclosures (4)

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